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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/697,620	10/29/2003	Manoj Singhal	15154US01	7311

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EXAMINER
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ART UNIT	PAPER NUMBER
2626	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/697,620	SINGHAL, MANOJ	
	Examiner	Art Unit	
	LEONARD SAINT CYR	2626	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *25 June 2009*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1, 4 – 8, 12, 13, 15, 16, 18, 19, and 21 - 25* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1, 4 – 8, 12, 13, 15, 16, 18, 19, and 21 - 25* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *29 October 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. Applicant's arguments filed 06/25/09 have been fully considered but they are not persuasive.

Applicant argues that neither Jiang, nor Boland, nor Ubale et al., teach allocating a number of bits for a plurality of frequency components resulting from transforming the audio signal into the frequency domain based on the classification of either speech or music; quantizing the frequency component resulting from transforming the audio signal into the frequency domain with the allocated number of bits based on the classification of either speech or music (Amendment, pages 7 – 10).

The examiner disagrees, since Ubale et al., disclose that "the multiband codebook bank 24 parameters are encoded every subframe. **The number of bits used to code these parameters are switched between the two sets, according to the output of the voice/music classifier 14 block**. The voice/music classification bit is then used to identify the correct configuration of codebooks. **The adaptive codebook 40 entries and the multiband codebook bank 24 entries and associated quantized gains are then determined for each subframe and the overall excitation is generated for each subframe.** The LPC analyzer 16 parameters **are quantized with 63 bits in the line-spectral-frequency (LSF) domain** for the 24 kbps version" (col.4, lines 11 – 13, and 20 – 24; col.7, lines 31 – 35).

Claim Rejections - 35 USC § 103

2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

3. Claims 1, 4 – 8, 12, 13, 15, 16, 18, 19, and 21 - 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jiang et al., (US Patent 6,901,362) in view of Boland et al., (US Patent 7,171,357), and further in view of Ubale et al., (US Patent 5,778,335).

Regarding claims 1 and 16, Jiang et al. discloses a method for classifying an audio signal (see col. 1, lines 7-8), the method comprising:

receiving an audio signal to be classified (see fig. 1, where audio signal 106 is input in to audio analyzer 104 and col. 3, line 21);

dividing the audio signal at least into sub-bands compatible with speech and incompatible with speech (see col. 3, lines 34-39);

comparing the sub band energy to a threshold value (see col. 8, lines 57-67), and classifying the audio signal based upon the comparison as either speech or music (see fig. 4 steps 246 and 252, and col. 3, line 22);

transforming the audio signal into frequency domain (col.5, line 65).

Jiang et al. fails to teach calculating a ratio of the sub-bands energies and using the ratio to compare to a threshold value; allocating a number of bits for each of a plurality of frequency components resulting from transforming the audio signal into the frequency domain based on the classification of either speech or music; quantizing each of the plurality of frequency components resulting from transforming the audio signal

into the frequency domain with the allocated number of bits based on the classification of either speech or music.

Boland discloses that periodicity measure has been used in speech codecs for pitch-period estimation and voice/unvoiced classification; a voice activity - detector that **uses energy ratios** (see col. 1, lines 49- 52, and 57 - 61). It would have been obvious to one of ordinary skill in the art at the time the invention was made to use Boland voice activity detection method of using sub-band ratios because it can distinguish between speech and non speech sounds better than using just sub-band energy (see col. 1, lines 52-55).

Jiang et al. in view of Boland does not disclose allocating a number of bits for each of a plurality of frequency components resulting from transforming the audio signal into the frequency domain based on the classification of either speech or music; quantizing each of the plurality of frequency components resulting from transforming the audio signal into the frequency domain with the allocated number of bits based on the classification of either speech or music.

Ubale et al., teach that the multiband codebook bank 24 parameters are encoded every subframe. **The number of bits used to code these parameters are switched between the two sets, according to the output of the voice/music classifier 14 block**. The voice/music classification bit is then used to identify the correct configuration of codebooks. **The adaptive codebook 40 entries and the multiband codebook bank 24 entries and associated quantized gains are then determined for each subframe and the overall excitation is generated for each subframe.** The LPC

analyzer 16 parameters **are quantized with 63 bits in the line-spectral-frequency (LSF) domain** for the 24 kbps version (col.4, lines 11 – 13, and 20 – 24; col.7, lines 31 – 35).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use adaptive bit allocation based on speech/music classifier as taught by Ubale et al., in Jiang et al., in view of Boland, because that would make digital compression of wideband speech or audio signals more efficient (col.1, lines 53 – 55).

Regarding claim 4, Boland et al., further disclose comprises integrating the sub-band compatible with speech, integrating the sub-band incompatible with speech, and calculating a ratio of the sub-bands (see col. 1, lines 49-52).

Regarding claims 5 and 21, Jiang et al. further discloses wherein classifying the audio signal based upon the comparison the ratio to the threshold value further comprises, if the ratio is less than the threshold value then the audio signal is classified as speech (see col. 8, lines 57-67).

Regarding claims 6 and 22, Jiang et al. further discloses wherein classifying the audio signal based upon the comparison of the ratio to the threshold value further comprises, if the ratio is greater than the threshold value, then the audio signal is classified as music (see co. 12, Table 1).

Regarding claim 7, Jiang et al. further discloses wherein dividing the audio signal into sub-bands compatible with speech and incompatible with speech further comprises dividing the audio signal into a first frequency sub-band comprising frequencies below 4 KHz and a second frequency sub-band comprising frequencies above 4 KHz (see col. 8, lines 34- 35).

Regarding claims 8 and 23, Jiang et al. further discloses wherein upon classifying the signal as one of speech and music, a classifying sub-band may be further divided and additional ratios calculated to provide more detailed information regarding an identity of a sound producer of the audio signal (see c01. 13, lines 9-10).

Regarding claims 12 and 18, Jiang et al. further discloses wherein the threshold value used in the comparison is pre-determined and pre-set by a user (see col. 4, lines 28- 30).

Regarding claims 13 and 19, Jiang et al. further discloses wherein the threshold value used in the comparison is determined through trial and error of a plurality of iterations in a comparing device (see col. 8, line 13-18).

Regarding claim 15, Jiang et al. further discloses wherein the audio signal is one of an analog signal and a digital signal (see fig. 1, element 106, col. 3, lines 23-25).

Regarding claim 17, Jiang et al. further discloses wherein the plurality of mathematical functions performed on the audio signal may comprise at least one of a Fourier Transform, squaring an amplitude, separating an audio spectrum into sub-bands, integrating the sub-bands, and calculating a ratio of integrated sub-bands (see fig. 3 element 222).

As per claims 24, and 25, Jiang et al., in view of Boland and further in view of Ubale et al., do not specifically teach allocating a higher number of bits to quantize higher frequency components if the audio signal is classified as music than a number of bits allocated to quantize the higher frequency components if the audio signal is classified as speech; allocating a higher number of bits to quantize lower frequency components if the audio signal is classified as speech than a number of bits allocated to quantize the lower frequency component is the audio signal is classified as music. However, since Ubale et al., disclose the multiband codebook bank 24 parameters are encoded every subframe. **The number of bits used to code these parameters are switched between the two sets, according to the output of the voice/music classifier 14 block**. For example, in a 2 band configuration and a given frame…An allocation of 6 bits for the high band and 8 bits for the low band would require that only the first 64 entries be searched for the high band and the first 512 entries be searched for the low band (col.4, lines 20 - 24; col. 9, lines 20 – 24).

One having ordinary in the art at the time the invention was made would have found it obvious to use adaptive bit allocation based on speech/music classifier for high and low frequency bands, because that would make digital compression of wideband speech or audio signals more efficient (col.1, lines 53 – 55).

Conclusion

4. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to LEONARD SAINT CYR whose telephone number is (571) 272-4247. The examiner can normally be reached on Mon- Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richemond Dorvil can be reached on (571) 272-7602. The fax phone

number for the organization where this application or proceeding is assigned is (571)-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or (571) 272-1000.

LS
10/31/09

/Richemond Dorvil/
Supervisory Patent Examiner, Art Unit 2626